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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,188	03/17/2004	Ken Orui	09792909-5820	3434
26263	7590	08/25/2005	EXAMINER	
SONNENSCHN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080			PATEL, ISHWARBHAI B	
			ART UNIT	PAPER NUMBER
			2841	

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/802,188

Applicant(s)

ORUI ET AL.

Examiner

Ishwar (I. B.) Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of group I, specie I, claims reading on figures 1A-4B, claims 1-5, in the reply filed on July 20, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The only argument was about the presence of a generic claim to other species. However, as stated in the previous action, if a generic claim is allowed, the applicant will be entitled to consideration of claims to additional species, which are written in depended form or otherwise include all the limitations of the allowed generic claims.

Claim Objections

2. Claims 1-5 are objected to because of the following:

Regarding claim 1, the limitations "a conductor portion which is formed on a surface of an insulating layer" and "said conductive portion which is formed at the same level as that of the surface of said insulating layer" are misleading. It is not clear how a conductor portion formed on a surface of an insulating layer is formed at the same level as that of the surface of said insulating layer.

Claims 2-5 depend upon claim 1 and inherit the same deficiency.

Appropriate correction is required.

For the examination purpose the conductor is considered to be on the same level as that of another insulating layer. The prior art applied accordingly.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Ohara, US Patent No. 6,924,553.

Regarding claim 1, Ohara, in figure 13 and 1A-D, discloses a junction structure for conductive projection, comprising a conductive projection (30) joined to a conductor portion (142) which is formed on a surface of an insulating layer (140), wherein said conductive projection is joined to the surface of said conductor portion which is formed at the same level as that of the surface of an insulating layer (14 or 144), and a root portion of said conductive projection is surrounded by a resin material (polyimide resin, column 9, line 45-46) in a ring form (see figure 1D).

Regarding claim 2, Ohara further discloses said resin material which surrounds said root portion of said conductive projection is in a fillet form (see figure 1D).

Regarding claim 3, Ohara discloses the structure as claimed. The resin material is in a cured state in the final device. The status of the resin or what it contains when in uncured state is a process limitation. Such a process limitation defines the claimed invention over the prior art only to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is the same as, or obvious over, the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, USPQ 964, 966 (Fed. Cir. 1985). Therefore, Ohara meet the claims.

Regarding claim 5, Ohara further discloses conductive projection comprises a core portion (30) and a conductive surface layer portion (32) for covering the surface of said core portion.

Claim Rejections - 35 USC § 103

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohara as applied to claim 1 above.

Regarding claim 4, Ohara discloses all the features of the claimed invention including the resin material (polyimide resin, column 9, line 45-46) surrounding the conductive projection as applied to claim 1 above, but does not explicitly discloses said

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resin material has photocuring property. However, Ohara further discloses a polyimide resin (20) with photocuring property to facilitate the patterning of the resin layer.

Therefore, it would have been obvious to a person of ordinary skill in the art to provide the circuit board of Ohara with the polyimide resin used for covering the conductive portion having a photocuring property in order to facilitate the patterning of the resin layer.

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka, US Patent No. 6,599,390.

Regarding claim 1, Tanaka, in figure 4, discloses a junction structure for conductive projection, comprising a conductive projection (3) joined to a conductor portion (7) which is formed on a surface of an insulating layer (2), wherein said conductive projection is joined to the surface of said conductor portion, and a root portion of said conductive projection is surrounded by a resin material (4) in a ring form (see figure 4). Tanaka does not disclose the conductor portion (7) formed on the same level as that of the insulating layer (8). However, the thickness of the insulating layer (8) will depend upon the degree of the protection required and the material used. Further, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesh*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the circuit board of Tanaka with the thickness

of the insulating layer same as that of the conductor layer, in order to have the desired protection to the surface of the board.

Regarding claim 2, Tanaka further discloses said resin material which surrounds said root portion of said conductive projection is in a fillet form (see figure).

Regarding claim 3, Tanaka further discloses said resin material contains an activator which assists the junction between said conductive projection and said conductor portion when said resin material is in an uncured state (column 3, line 40-47 and column 4, line 33-37).

Regarding claim 4, Tanaka discloses the structure as claimed. The resin is fully cured in the final device. Whether it is photocured as having a photocuring property or cured by any other method does not differentiate the final product. Therefore Tanaka meets the limitation.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka as applied to claim 1 above, and further in view of Kurita et al., US Patent No. 6,799,711.

Regarding claim 5, Tanaka discloses all the features of the claimed invention including the conductive projection as applied to claim 1 above, but does not explicitly

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disclose the conductive projection comprises a core portion and a conductive surface layer portion for covering the surface of said core portion.

Kurita et al., discloses a solder ball made of copper with solder, wherein solder will help in better electrical and mechanical connection and copper will withstand the weight and will not allow the ball to be flattened enabling highly reliable connection of electronic parts to printed circuit board, column 1, line 35-47.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the conductive connection of Tanaka with a core portion and a conductive surface layer portion for covering the surface of said core portion, as taught by Kurita et al., in order to have a highly reliable connection of electronic parts to printed circuit board.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shoji, US Patent No. 5,869,904, in figure 5, discloses a conductive projection 14 formed on a substrate (13a), with a fillet (15) around the conductive projection.


Chiu et al., US Patent No. 6,696,644, in figure 5, discloses a conductive projection 52 formed on an insulating layer 53 with a fillet 54a. Also, it can be seen that thickness of layer insulating layer 54b, beyond the fillet region appears to same as that of the conductive portion 51.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272 1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Ishwar (I. B.) Patel
Examiner
AU: 2841
August 22, 2005